

## REMARKS

This application has been carefully reviewed in light of the Office Action dated September 24, 2003 (Paper No. 16). Claims 1 and 3 to 10 are in the application, of which Claim 1 is the sole independent claim. Claims 1 and 3 to 8 have been amended herein. Reconsideration and further examination are respectfully requested.

Initially, Applicants' representative thanks the Examiner for the courtesies and thoughtful treatment afforded during telephonic interviews conducted on September 16, 2003, September 17, 2003, and September 18, 2003. The amendments made herein are based on these interviews.

During the interview held on September 16, 2003, several claim proposals were discussed relating to the feature of the soldering through holes, particularly with regard to the constitution of each land and the orientation of the pair of lands in relation to the soldering through holes. During the September 17, 2003 interview, the Examiner tentatively agreed to proposed claim amendments relating to the features of the plurality of soldering through holes, and stated that the application was generally in condition for allowance.

The above amendment to Claim 1 includes, among other changes, amendments which follow through on these proposals. Specifically, Claim 1 now indicates that the printed circuit board comprises a plurality of soldering through holes each opening in the opposite surfaces for inserting leads of an inserted component to be mounted onto the printed wiring board, for soldering the leads of an inserted component onto the substrate. Moreover, Claim 1 also indicates that each of the plurality of soldering through

holes has an inner peripheral surface and a pair of lands, each land of the pair of lands being formed on respective ones of the opposite surfaces and formed continuously over the inner peripheral surface.

Furthermore, during the September 17, 2003 interview the Examiner indicated that it would be beneficial to provide greater specificity to recitations involving the connection portion, particularly with regard to the location of the connection state maintaining means. Claim 1 has been amended in accordance with the Examiner's suggestion, and now indicates that the connection portion is maintained in a state not wetted by solder, and except for the connection portion, at least one land of the pair of lands is maintained in a state wetted by solder.

In the Office Action, Claims 1 and 8 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. Specifically, the Office Action alleged that Claim 1 was indefinite for failing to show whether or not the inner peripheral surface is plated with a conductive material. Furthermore, the Office Action alleged that it was not clearly shown where on the printed wiring board the connection state maintaining means is formed and not formed. Moreover, the Office Action alleged that Claim 8 was structurally indefinite.

As indicated above, Claim 1 has been amended in accordance with the proposed claim language agreed upon by the Examiner during the September 17, 2003 interview, and Claim 8 has been amended in accordance with the claim language suggested by the Examiner in the Office Action. As such, reconsideration and withdrawal of the § 112 rejection is respectfully requested.

Claims 1, 3 to 5, 7 and 8 were rejected under 35 U.S.C. § 102(b) over U.S. Patent No. 3,610,811 (O'Keefe); and Claims 1 and 3 to 10 were rejected under 35 U.S.C. § 103(a) over O'Keefe in view of U.S. Patent No. 5,720,932 (Sarkhel). Reconsideration and withdrawal of the § 102 and § 103 rejections are respectfully requested.

The invention generally concerns a printed wiring board. The printed wiring board comprises a substrate having two opposite surfaces and a plurality of soldering through holes formed in the substrate, each of the plurality of soldering through holes opening in opposite surfaces for inserting leads of an inserted component to be mounted onto the printed wiring board, and for soldering the leads of an inserted component onto the substrate. Each of the plurality of soldering through holes has an inner peripheral surface and a pair of lands, each land of the pair of lands being formed on respective ones of the opposite surfaces and formed continuously over the inner peripheral surface. At least one land of the pair of lands is connected to at least one wiring pattern at a connection portion. The connection portion is maintained in a state not wetted by solder, and, except for the connection portion, the at least one land of the pair of lands is maintained in a state wetted by solder.

Thus, among the many features of the invention, at least one land of the pair of lands is connected to at least one wiring pattern at a connection portion, where the connection portion is maintained in a state not wetted by solder, and where, except for the connection portion, the at least one land of the pair of lands is maintained in a state wetted by solder. To its advantage, the invention helps reduce the incidence of breakage of the wiring pattern caused by stress on each of the pairs of lands during soldering.

Additionally, the strength of the interface between an inserted component and the substrate can be maintained.

The applied art is not seen to disclose or to suggest the features of the present invention. In particular, the applied art is not seen to provide for at least one land of the pair of lands which is connected to at least one wiring pattern at a connection portion, where the connection portion is maintained in a state not wetted by solder, and where, except for the connection portion, the at least one land of the pair of lands is maintained in a state wetted by solder.

As discussed in detail in the Amendment dated May 13, 2003, O'Keefe discloses a circuit board with a plurality of plated through holes with solder resist covering a portion of the circuit board surface along the perimeter of each plated through hole. See O'Keefe, col. 2, ll. 40 to 51. In O'Keefe, however, the portion of the perimeter of each plated through hole which is covered by solder resist is seen to be determined by applying parallel stripes of solder resist on to the top surface of the circuit board, such that the edges of the stripes preferably overlap to some degree or are tangential to the apertures of the circuit board around each of the plated-through holes. See O'Keefe, col. 4, ll. 45 to 50; Figs. 1 and 2.

As depicted in Figures 1 and 2 of O'Keefe, the striping technique of O'Keefe is seen to result in the application of solder resist based solely on the position of the aperture, and is not seen to take into account the respective orientation of the portion connecting the aperture 30 to the printed circuitry 20, corresponding to the connection portion of the present invention, in determining where to apply solder resist. See O'Keefe, Figs. 1 and 2. In this regard, O'Keefe is not seen to provide for at least one land of the pair

of lands which is connected to at least one wiring pattern at a connection portion, where the connection portion is maintained in a state not wetted by solder, and where, except for the connection portion, the at least one land of the pair of lands is maintained in a state wetted by solder.

Sarkhel, either alone or in combination with O'Keefe, is not seen to disclose or to suggest anything to remedy the foregoing deficiencies of O'Keefe, particularly with regard to the feature of at least one land of the pair of lands which is connected to at least one wiring pattern at a connection portion, where the connection portion is maintained in a state not wetted by solder, and where, except for the connection portion, the at least one land of the pair of lands is maintained in a state wetted by solder.

Accordingly, based on the foregoing amendments and remarks, independent Claim 1 is believed to be allowable over the applied references. The other claims in the application are each dependent from the independent claim and are believed to be allowable over the applied references for at least the same reasons. Because each dependent claim is deemed to define an additional aspect of the invention, however, the individual consideration of each on its own merits is respectfully requested.

In view of the foregoing amendments and remarks, the entire application is believed to be in condition for allowance and such action is respectfully requested at the Examiner's earliest convenience.

Regarding a formal matter involving the drawings, it is respectfully requested for the next communication from the Office to indicate that the replacement drawing sheet for Figures 7 and 8, as filed on September 17, 2003, has been approved.

Applicants' undersigned attorney may be reached in our Costa Mesa,  
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Respectfully submitted,

  
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